

Study of Low and High Harmonic Energy Amplification Due to Outer Surf-zone Wave Breaking

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Abstract

In this study, the laboratory observations were accomplished for 36 random and irregular waves initiated according to the JONSWAP spectrum to study the importance of energy transition to low and high frequency harmonics due to wave breaking in the outer surf-zone. The wave transformation was investigated using two trinary groups of pressure sensors at the beginning and end of ramp with the slope of 1:16. The maximum observed transferred energy due to wave breaking was about 22% of dissipated energy which was equal to 9% of total energy of the primary wave. In this manner, the predicted significant broken wave height was 8% underestimated using phased averaged wave models. The observations indicated the fraction of dissipated energy, which was transferred to low and high frequencies growth with increment of primary wave Ursell parameter at the initial depth.

Keywords: Energy transition, Low and high frequencies, Wave breaking, Laboratory observations.
